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(54) Title: SMALL SPECTRAL SIGNAL DETECTION SYSTEM

(57) Abstract: A standoff chemical agent detection system passively detects chemical agents in a scene. Interferograms are generated from received scene spectral information. In one embodiment, the spectral information is apodized, and a chirp Fast Fourier Transform is performed on the interferogram. A calibration curve is applied to correct gain and offset, and a feature vector is generated based on comparison of the normalized spectrum to predetermined chemical shape templates. The feature vector is provided to a classifier to identify the existence and identity of a chemical agent threat. The chemical agent detection system utilizes a lower resolution search mode, and a higher resolution confirmation mode, wherein both modes utilize the same detection algorithms. The neural network is trained using a large database of training data. The network is iteratively trained using partially random subsets of the training data. Problematic data from previous subsets is included in further subsets to improve the training.

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G01J3/453 G01N21/35

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01J G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, PAJ, EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	US 5 241 179 A (CARRIERI ARTHUR H) 31 August 1993 (1993-08-31) column 1, line 15 - line 20 column 2, line 28 - column 3, line 38 figure 1  --- -/-	1,9,16, 24,25

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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